

Inconsistency of Contact Exciting Force 3 i 3

the constitution of an electrolyte, then they can produce current force (656, 659) proportionate to the amount of chemical force consumed (603).

1057. But the contact theory, which is obliged, according to the facts, to admit that the acting particles are not changed (790, 1055) (for otherwise it would be the chemical theory), is constrained to admit also that the force which is able to make two particles assume a certain state in respect to each other, is unable to make them *retain* that state; and so it virtually denies the great principle in natural philosophy, that cause and effect are equal (1059). If a particle of platinum by contact with a particle of zinc willingly gives of its own electricity to the zinc, because this by its presence tends to make the platinum assume a negative state, why should the particle of platinum take electricity from any other particle of platinum behind it, since that would only tend to destroy the very state which the zinc has just forced it into? Such is not the case in common induction (and Marianini admits that the effect of contact may take place through air and measurable distances¹); for there a ball rendered negative by induction will not take electricity from surrounding bodies, however thoroughly we may uninsulate it; and if we force electricity into it, it will, as it were, be spurned back again with a power equivalent to that of the inducing body.

1058. Or if it be supposed rather, that the zinc particle, by its inductive action, tends to make the platinum particle positive, and the latter, being in connection with the earth by other platinum particles, calls upon them for electricity, and so acquires a positive state; why should it discharge that state to the zinc, the very substance which, making the platinum assume that condition, ought of course to be able to sustain it? Or again, if the zinc tends to make the platinum particle positive, why should not electricity go to the platinum *from the zinc*, which is as much in contact with it as its neighbouring platinum particles are? Or if the zinc particle in contact with the platinum tends to become positive, why does not electricity flow to it from the zinc particles behind, as well as from the platinum?²

¹ *Memorie della Societa Italiana in Modena*, 1837, xxi.
232, 233, etc.

² I have spoken, for simplicity of expression, as if one metal were active and the other passive in bringing about these induced states, and not, as the theory implies, as if each were mutually subject to the other. But this makes no difference in the force of the argument; whilst an endeavour to state fully the joint changes on both sides would rather have obscured the objections which arise, and which[^] af&f\$u4^5>\$tfQnf in either view.